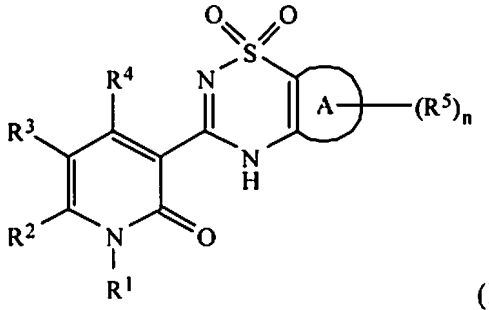
Allowed Claims in U.S. Patent Application No. 11/777,692

19. A process for preparation of a compound, a stereoisomer of the compound, a tautomer of the compound, or a pharmaceutically acceptable salt of the compound, stereoisomer, or tautomer, wherein:

the compound corresponds to formula (I):



(I) ;

A is thienyl;

R^1 is cyclobutyl-$N(R_a)$-, wherein the cyclobutyl is optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl, -(alkyl)(OR_c), -(alkyl)(NR_cR_e), -SR_c, -$S(O)R_c$, -$S(O)_2R_c$, -OR_c, -$N(R_c)(R_e)$, -$C(O)R_c$, -$C(O)OR_c$, and -$C(O)NR_cR_e$;

as to R^2 and R^3:

R^2 and R^3 are independently selected from the group consisting of hydrogen, alkenyl, alkynyl, alkoxyalkyl, alkoxycarbonyl, alkyl, aryl, arylalkyl, heteroaryl, heterocycle, heteroarylalkyl, cyano, halo, -$N(R_a)(R_b)$, $R_aR_bNC(O)$-, -SR_a, -$S(O)R_a$, -$S(O)_2R_a$, and $R_aC(O)$-, wherein each such substituent is optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of R_a, alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, -(alkyl)(OR_k), -(alkyl)(NR_aR_b), -SR_a, -$S(O)R_a$, -$S(O)_2R_a$, -OR_k, -$N(R_a)(R_b)$, -$C(O)R_a$, -$C(O)OR_a$, and -$C(O)NR_aR_b$, or, alternatively,

R^2 and R^3, together with the carbon atoms to which they are attached, form a five- or six-membered ring selected from the group consisting of aryl, cycloalkyl, heteroaryl, and heterocycle, wherein each such substituent is optionally substituted with m independently selected R^6 substituents;

R^4 is selected from the group consisting of alkoxy, arylalkoxy, aryloxy, halo, hydroxy, R_aR_bN-, N_3-, and R_eS-, wherein each such substituent is optionally substituted with or 2 substituents independently selected from the group consisting of halo, nitro, cyano, -OH, -NH_2, and -COOH;

as to R^5:

at least one R^5 is $R_aSO_2N(R_f)$alkyl-, and

each additional R^5 is independently selected from the group consisting of alkenyl, alkoxy, alkyl, alkynyl, aryl, arylalkyl, arylcarbonyl, aryloxy, azidoalkyl, formyl, halo, haloalkyl, halocarbonyl, heteroaryl, heteroarylalkyl, heterocycle, heterocyclealkyl, hydroxyalkyl, cycloalkyl, cyano, cyanoalkyl, nitro, R_aR_bN-, $R_aC(O)$-, R_aS-, $R_a(O)S$-, $R_a(O)_2S$-, $R_aR_bNalkyl$-, $R_a(O)SN(R_f)$-, $R_aSO_2N(R_f)$-, $R_a(O)SN(R_f)alkyl$-, $R_aSO_2N(R_f)alkyl$-, $R_aR_bNSO_2N(R_f)$-, $R_aR_bNSO_2N(R_f)alkyl$-, $R_aR_bNC(O)$-, $R_kOC(O)$-, $R_kOC(O)alkyl$-, $R_kOalkyl$-, $R_aR_bNSO_2$-, $R_aR_bNSO_2alkyl$-, $(R_bO)(R_a)P(O)O$-, and $-OR_k$, wherein each such substituent is optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl, $-(alkyl)(OR_c)$, $-(alkyl)(NR_cR_d)$, $-SR_c$, $-S(O)R_c$, $-S(O)_2R_c$, $-OR_c$, $-N(R_c)(R_d)$, $-C(O)R_c$, $-C(O)OR_c$, and $-C(O)NR_cR_d$;

each R^6 is independently selected from the group consisting of alkyl, alkenyl, alkynyl, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, heterocyclealkyl, $-(alkyl)(OR_k)$, $-(alkyl)(NR_aR_b)$, $-SR_a$, $-S(O)R_a$, $-S(O)_2R_a$, $-OR_k$, $-N(R_a)(R_b)$, $-C(O)R_a$, $-C(O)OR_a$, and $-C(O)NR_aR_b$, wherein each such substituent is optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, haloalkyl, cyano, nitro, $-OR_a$, $-NR_aR_b$, $-SR_a$, $-SOR_a$, $-SO_2R_a$, $-C(O)OR_a$, $-C(O)NR_aR_b$, and $-NC(O)R_a$;

as to R_a and R_b:

each R_a and R_b is independently selected from the group consisting of hydrogen, alkenyl, alkyl, alkylsulfanylalkyl, aryl, arylalkenyl, arylalkyl, cyanoalkyl, cycloalkenyl, cycloalkenylalkyl, cycloalkyl, cycloalkylalkyl, cycloalkylalkenyl, formylalkyl, haloalkyl, heteroaryl, heteroarylalkenyl, heteroarylalkyl, heterocycle, heterocyclealkenyl, heterocyclealkyl, hydroxyalkylcarbonyl, nitroalkyl, R_cR_dN-, R_pO-, $R_pOalkyl$-, $R_cR_dNalkyl$-, $R_cR_dNC(O)alkyl$-, R_cSO_2-, R_cSO_2alkyl-, $R_cC(O)$-, $R_cC(O)alkyl$-, $R_cOC(O)$-, $R_cOC(O)alkyl$-, $R_cR_dNalkylC(O)$-, $R_cR_dNC(O)$-, $R_cR_dNC(O)Oalkyl$-, and $R_cR_dNC(O)N(R_c)alkyl$-, wherein each such substituent is optionally substituted with 1 or 2 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl, $-(alkyl)(OR_c)$, $-(alkyl)(NR_cR_d)$, $-SR_c$, $-S(O)R_c$, $-S(O)_2R_c$, $-OR_c$, $-N(R_c)(R_d)$, $-C(O)R_c$, $-C(O)OR_c$, and $-C(O)NR_cR_d$, or alternatively,

R_a and R_b, together with the nitrogen atom to which they are attached, form a three- to six-membered ring selected from the group consisting of heteroaryl and heterocycle, wherein the heteroaryl and heterocycle are optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl,

-(alkyl)(OR_c), -(alkyl)(NR_cR_d), -alkyl$SO_2NR_cR_d$, -alkylC(O)NR_cR_d, -SR_c, -S(O)R_c, -$S(O)_2R_c$, -OR_c, -$N(R_c)(R_d)$, -C(O)R_c, -C(O)OR_c, and -C(O)NR_cR_d;

as to R_c and R_d:

each R_c and R_d is independently selected from the group consisting of hydrogen, -NR_fR_h, -OR_f, -$CO(R_f)$, -SR_f, -SOR_f, -SO_2R_f, -C(O)NR_fR_h, -$SO_2NR_fR_h$, -C(O)OR_f, alkenyl, alkyl, alkynyl, cycloalkyl, cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, aryl, arylalkyl, haloalkyl, heteroaryl, heteroarylalkyl, heterocycle, and heterocycloalkyl, wherein each such substituent is optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl, -(alkyl)(OR_f), -(alkyl)(NR_fR_h), -SR_f, -S(O)R_f, -$S(O)_2R_f$, -OR_f, -$N(R_f)(R_h)$, -C(O)R_f, -C(O)OR_f, -C(O)NR_fR_h, -C(O)N(H)NR_fR_h, -$N(R_e)$C(O)OR_f, -$N(R_e)SO_2NR_fR_h$, -$N(R_e)$C(O)NR_fR_h, -alkyl$N(R_e)$C(O)OR_f, -alkyl$N(R_e)SO_2NR_fR_h$, and -alkyl$N(R_e)$C(O)NR_fR_h, or alternatively,

R_c and R_d, together with the nitrogen atom to which they are attached, form a three- to six-membered ring selected from the group consisting of heteroaryl and heterocycle, wherein the heteroaryl and heterocycle are optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl, -(alkyl)(OR_f), -(alkyl)(NR_fR_h), -SR_f, -S(O)R_f, -$S(O)_2R_f$, -OR_f, -$N(R_f)(R_h)$, -C(O)R_f, -C(O)OR_f, and -C(O)NR_fR_h;

each R_e is independently selected from the group consisting of hydrogen, alkenyl, alkyl, and cycloalkyl;

as to R_f and R_h:

each R_f and R_h is independently selected from the group consisting of hydrogen, alkyl, alkenyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, heterocycle, heterocyclealkyl, heteroaryl, and heteroarylalkyl, wherein each such substituent is optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, cyano, halo, oxo, nitro, aryl, arylalkyl, cycloalkyl, cycloalkenyl, heterocycle, heteroaryl, heteroarylalkyl, –OH, -O(alkyl), -NH_2, -N(H)(alkyl), -$N(alkyl)_2$, -S(alkyl), -S(O)(alkyl), -SO_2alkyl, -alkyl-OH, -alkyl-O-alkyl, -alkylNH_2, -alkylN(H)(alkyl), -alkyl$N(alkyl)_2$, -alkylS(alkyl), -alkylS(O)(alkyl), -alkylSO_2alkyl, -N(H)C(O)NH_2, -C(O)OH, -C(O)O(alkyl), -C(O)alkyl, -C(O)NH_2, -C(O)NH_2, -C(O)N(H)(alkyl), and -C(O)$N(alkyl)_2$, or alternatively,

R_f and R_h, together with the nitrogen atom to which they are attached, form a three- to seven-membered ring selected from the group consisting of heterocycle and heteroaryl, wherein

the heterocycle and heteroaryl are optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, cyano, halo, oxo, nitro, aryl, arylalkyl, cycloalkyl, cycloalkenyl, heterocycle, heteroaryl, heteroarylalkyl, –OH, -O(alkyl), $-NH_2$, -N(H)(alkyl), $-N(alkyl)_2$, -S(alkyl), -S(alkyl), -S(O)(alkyl), -alkyl-OH, -alkyl-O-alkyl, $-alkylNH_2$, -alkylN(H)(alkyl), -alkylS(alkyl), -alkylS(O)(alkyl), $-alkylSO_2alkyl$, $-alkylN(alkyl)_2$, $-N(H)C(O)NH_2$, -C(O)OH, -C(O)O(alkyl), -C(O)alkyl, $-C(O)NH_2$, $-C(O)NH_2$, -C(O)N(H)(alkyl), and $-C(O)N(alkyl)_2$;

each R_k is independently selected from the group consisting of hydrogen, alkenyl, alkyl, aryl, arylalkyl, cyanoalkyl, cycloalkenyl, cycloalkenylalkyl, cycloalkyl, cycloalkylalkyl, formylalkyl, haloalkyl, heteroaryl, heteroarylalkyl, heterocycle, heterocyclealkyl, nitroalkyl, $R_aR_bNalkyl$-, $R_aOalkyl$-, $R_aR_bNC(O)$-, $R_aR_bNC(O)alkyl$, R_aS-, $R_aS(O)$-, R_aSO_2-, $R_aSalkyl$-, $R_a(O)Salkyl$-, R_aSO_2alkyl-, $R_aOC(O)$-, $R_aOC(O)alkyl$-, $R_aC(O)$-, and $R_aC(O)alkyl$-, wherein each such substituent is optionally substituted with 1, 2, or 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl, $-(alkyl)(OR_c)$, $-(alkyl)(NR_cR_d)$, $-SR_c$, $-S(O)R_c$, $-S(O)_2R_c$, $-OR_c$, $-N(R_c)(R_d)$, $-C(O)R_c$, $-C(O)OR_c$, and $-C(O)NR_cR_d$;

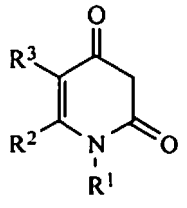
each R_p is independently selected from the group consisting of hydrogen, alkenyl, alkyl, aryl, arylalkyl, cyanoalkyl, cycloalkenyl, cycloalkenylalkyl, cycloalkyl, cycloalkylalkyl, formylalkyl, haloalkyl, heteroaryl, heteroarylalkyl, heterocycle, heterocyclealkyl, and nitroalkyl, wherein each such substituent is optionally substituted with 1, 2, or, 3 substituents independently selected from the group consisting of alkyl, alkenyl, alkynyl, oxo, halo, cyano, nitro, haloalkyl, haloalkoxy, aryl, heteroaryl, heterocycle, arylalkyl, heteroarylalkyl, alkoxyalkoxyalkyl, $-(alkyl)(OR_c)$, $-(alkyl)(NR_cR_d)$, $-SR_c$, $-S(O)R_c$, $-S(O)_2R_c$, $-OR_c$, $-N(R_c)(R_d)$, $-C(O)R_c$, $-C(O)OR_c$, and $-C(O)NR_cR_d$;

m is 1, 2, 3, or 4;

n is 1, 2, 3, or 4; and

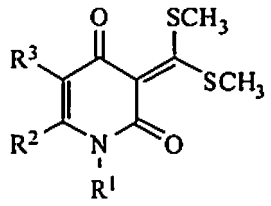
the process comprises:

(a) contacting a compound of formula (26)



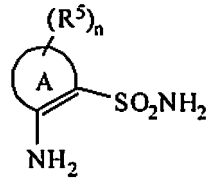
(26)

with a reagent selected from the group consisting of (1) carbon disulfide and a methylating agent, (2) tris(methylthio)methyl methyl sulfate, and (3) tris(methylthio)methyl methyl tetrafluoroborate, in the presence of a base, to provide a compound of formula (27)



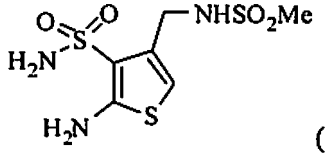
(27); and

(b) contacting the compound of formula (27) with a compound of formula (13)



(13).

20. The process of claim **19**, wherein the compound of formula (13) is 2-amino-4-(methane-sulfonylamino-methyl)-thiophene-3-sulfonic acid amide:



(13A).